STATE OF NORTH CAROLINA
DEPARTMENT OF ADMINISTRATION
DIVISION OF PURCHASE AND CONTRACT

4110-2K
August 18, 2006
Supersedes
4110-2J
June 6, 2001

SPECIFICATION FOR ICE MAKERS, BINS AND DISPENSERS

(This specification is released for procurement purposes until revised or rescinded)

SCOPE

This specification covers the requirements for air-cooled and water-cooled automatic commercial ice makers, bins and dispensers. It is not intended to cover all types and sizes of units that may be commercially available, but only those most frequently used by state agencies.

I. CLASSIFICATION

Ice makers, bins and dispensers covered by this specification are classified as follows:

A. AUTOMATIC ICE MAKER, MODULAR OR SELF CONTAINED

Type I - Cubed Ice – full cube size 7/8”x7/8”x7/8”
Minimum Harvest Rates:
Size 1 = 220 lbs per day
Size 2 = 320 lbs per day
Size 3 = 580 lbs per day
Size 4 = 1000 lbs per day

B. ICE STORAGE BIN

Minimum Storage Capacities:
66% of the harvest rate per day of the ice makers specified herein.

C. ICE DISPENSER

Sized for connection to the ice makers specified herein.

II. APPLICABLE STANDARDS

The following documents of issue in effect on the date of the Invitation for Bids shall form a part of this specification to the extent specified herein. All units shall conform to these specifications and shall bear the NSF and UL Listing Mark. In lieu of the UL Listing Mark, the ETL Seal or the Seal of an independent testing laboratory acceptable to the N.C. Department of Insurance is acceptable.

ARI - 810 - Automatic Commercial Ice Makers
ARI - 820 - Ice Storage Bins

Air Conditioning and Refrigeration Institute (ARI)
1501 Wilson Boulevard
Arlington, VA 22209
www.**ari**.org

NSF Standard No. 12 - Automatic Ice Making Equipment
National Sanitation Foundation (NSF)
3475 Plymouth Road
Ann Arbor, MI 48106
www.**nsf**.org

UL - 563 - Ice Makers
UL - 763 - Food Preparation Machines, Commercial
Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, IL 60062-2092
www.**ul**.com, http://ulstandardsinfonet.ul.com

III. REQUIREMENTS

A. ICE MAKER

The automatic ice maker shall include compressor-condensing unit(s), evaporator, water circulating system, connecting piping and wiring, automatic control system, harvesting equipment, and the safety devices necessary for forming and harvesting ice. Operation can be a continuous cycle or a batch process.

In operation, water shall be frozen in the evaporator, released, and then harvesting equipment shall deliver the ice to the storage bin or dispenser in a hard-frozen form. The cycle shall be entirely automatic and shall be repeated until the storage bin is full of ice, at which time the unit shall shut off automatically. Removal of an appreciable amount of ice from the storage bin shall cause the unit to automatically start to produce ice again, and refill the bin.

The performance of Type 1 ice-makers shall be verified by tests certified by Air Conditioning and Refrigeration Institute in accordance with the ARI Standard 810 with ratings information published in the ARI Certified Products Directory. Ratings information shall include harvest rate, electrical KWH and gallons of potable water per 100 lbs of ice produced.

Unit shall be provided with sufficient insulation so that no condensation drips from the unit when it operates for four hours in an ambient air dry-bulb temperature of 90 degrees F., 78 degrees F. wet-bulb.

The motor-compressor for the condensing unit shall be a hermetically sealed, externally mounted unit with automatic overload protection. It shall be permanently sealed in oil and shall require no additional lubrication.

The refrigerant flow shall be controlled by a properly calibrated capillary tube, a combination solenoid valve and thermostatic expansion valve, or an automatic expansion valve.

The condenser shall be air-cooled or water-cooled. Water cooled units shall have an automatic flow control valve, and the system protected from high pressure by an automatic-reset. Remote air-cooled condensers are not included in this specification.

B. ICE BIN

Insulated storage bin shall be provided with an NSF approved cabinet and liner, and necessary safety devices. Unit shall be provided with sufficient insulation so that no condensation drips from the unit when it operates for four hours in an ambient air dry-bulb temperature of 90 degrees F., 78 degrees F. wet-bulb. The bin liner shall be sufficiently reinforced to eliminate distortion. The storage bin shall comply with the requirements of ARI Standard 820, latest issue.

C. ICE DISPENSER

The automatic or manual ice dispenser shall be equipped with a dispensing mechanism for dispensing ice. The unit shall have a suitable means provided for preventing bridging of ice in the storage bin. The dispenser must protect the ice from outside contamination while it is in storage. It must be readily cleanable so that frequent cleaning can be done.

D. GENERAL

1. WORKMANSHIP

All materials shall be new, suitable for the intended purpose and free from any defect that may affect the serviceability and appearance of the equipment.

2. NAMEPLATE DATA

The following information is to be marked on a conspicuous, suitable nameplate:

a) Name of manufacturer of completely assembled unit.
b) Manufacturer's type, model number and serial number.
c) The operating voltage, frequency and amperes.
d) Type of refrigerant used.
e) Amount of refrigerant required.
f) Factory test pressure for high and low sides.
g) Any other requirements mentioned elsewhere in this specification.

The following data shall be furnished with each unit, but not necessarily on the nameplate:

a) Name of manufacturer of compressor, controls, motors, etc.
b) Wiring diagram.

IV. UTILITY EFFICIENCY COST EVALUATION

All proposals meeting the requirements of this specification will be evaluated on the basis of utility efficiency cost.

The utility efficient cost shall be the initial purchase price plus the operating costs of electricity and water consumed over the time period as noted in the formula.

The utility efficient cost shall be determined as follows:

Utility efficient cost (EEC) formula:
UEC = Bid Price + Cost of Energy + Cost of Water
UEC = P + (C x [((E x ER) + (W x WR))] x F x 365 x 5)

Where:
P = Bid Price
C = Minimum harvest rate for 24 hour ice making period
F = 2/3 operation factor for 5 years
E = KWH per lb of ice (ARI certification ratings for unit bid indicates KWH per 100 lb. of ice ÷ 100)
ER = $0.08/KWH (EXAMPLE ONLY – may be increased to reflect utilities at time of bid.)
W = Gallon per lb of ice (ARI certification ratings for unit bid indicates Gal per 100 lb. of ice ÷ 100)
WR = $0.00683 per gallon of potable water (EXAMPLE ONLY – may be increased to reflect utilities at time of bid.)

Example:
P = Bid Price - $3,343.00
C = 1,000 Harvest Rate (Lbs of Ice Produced in 24 Hours)
F = 2/3 operation factor for 5 years
E = 0.056 KWH per lb of ice (ARI ratings for KWH per 100 lb. of ice ÷ 100)
ER = $0.08/KWH
W = 0.18 Gallon per lb of ice (ARI ratings for Gal per 100 lb. of ice ÷ 100)
WR = $0.0068 per gallon potable water

UEC = $3,343.00 + C x [(0.08 x 0.056) + (0.18 x 0.0068)] X (2/3) x 365 x 5
UEC = $3,343.00 + 1000 x [(0.00448 + 0.00123)] X (2/3) x 365 x 5
UEC = $3,343.00 + 1000 x 0.00571 X (2/3) x 365 x 5
UEC = $3,343.00 + 6,947.16
UEC = $10,290.16

V. WARRANTY

Equipment furnished under this specification shall be guarant eed against defects in materials, workmanship, and performance in accordance with the manufacturer's standard warranty, except that in no event shall such coverage be for less than one year on the complete unit and four additional years on the motor-compressor unit, from the completion date of the "check, start and adjust" procedure by the contractor or his authorized representative. Warranty coverage shall begin on the date of the "check, start and adjust" procedure by the contractor or his authorized representative. Warranty repairs, including parts, freight costs, labor, and travel to user's site shall be at no expense to the owner or his representative.

VI. SERVICE, PARTS, AND MANUALS

The contractor shall furnish a manual containing complete instructions for installation, operation, and maintenance including complete lists of replacement parts or assemblies, indicating manufacturer and part or assembly number with each ice machine.

The contractor or his authorized representative shall perfo rm the "check, start and adjust" procedure promptly upon notification by the owner that the machine has been installed and is ready to be placed into operation.

VII. ACCEPTANCE EVALUATION AND QUALITY ASSURANCE

The delivered units shall be inspected for specification compliance.

The manufacturer shall be responsible for any testing required by ARI, UL and NSF.

The state reserves the right to request testing by a third party independent laboratory to substantiate product compliance to previous data submitted or to the specifications listed within. The state may alternately request copies of recent test data by a third party independent laboratory. The Division of Purchase & Contracts shall approve the laboratory for the new data submitted. The bidder is responsible for providing the verification test results. All cost associated with the samples and testing shall be borne by the bidder.

VIII. DELIVERY AND PAYMENT

Delivery of and payment for ice makers under this specification shall be in accordance with the terms and conditions of the Invitation for Bids. The contractor shall be responsible for any packing, packaging, or protection required to insure delivery in an undamaged condition.

IX. ORDERING DATA (FOR PURCHASE AND CONTRACT USE ONLY)

Purchasers should exercise any desired options offered herein, and should specify the following in the requisition and Invitation for Bids:

1. Title, number, and date of this specification.
2. Type unit desired (full cube).
3. Size number to indicate the ice making capacity (harvest rate) and storage bin capacity.
4. If condenser is to be air-cooled or water-cooled.
5. Type cabinet desired.
6. Electrical Characteristics needed.
7. Current electrical and potable water cost rates for the Utility Efficient Cost (UEC) formula.

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